

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
1 September 2005 (01.09.2005)

PCT

(10) International Publication Number
WO 2005/080896 A1

(51) International Patent Classification⁷: **F26B 21/08**,
F25B 5/00

(72) Inventors; and

(75) Inventors/Applicants (for US only): **TAMURA, To-
moichiro. YAKUMARU, Yuuichi. HONMA, Masaya.
NISHIWAKI, Fumitoshi.**

(21) International Application Number:
PCT/JP2005/002944

(22) International Filing Date: 17 February 2005 (17.02.2005)

(74) Agents: **SHIMIZU, Yoshihiro** et al.; 3rd Floor, Yashiro
Building, 14-4, Takadanobaba 2-chome, Shinjuku-ku,
Tokyo 169-0075 (JP).

(25) Filing Language: English

(26) Publication Language: English

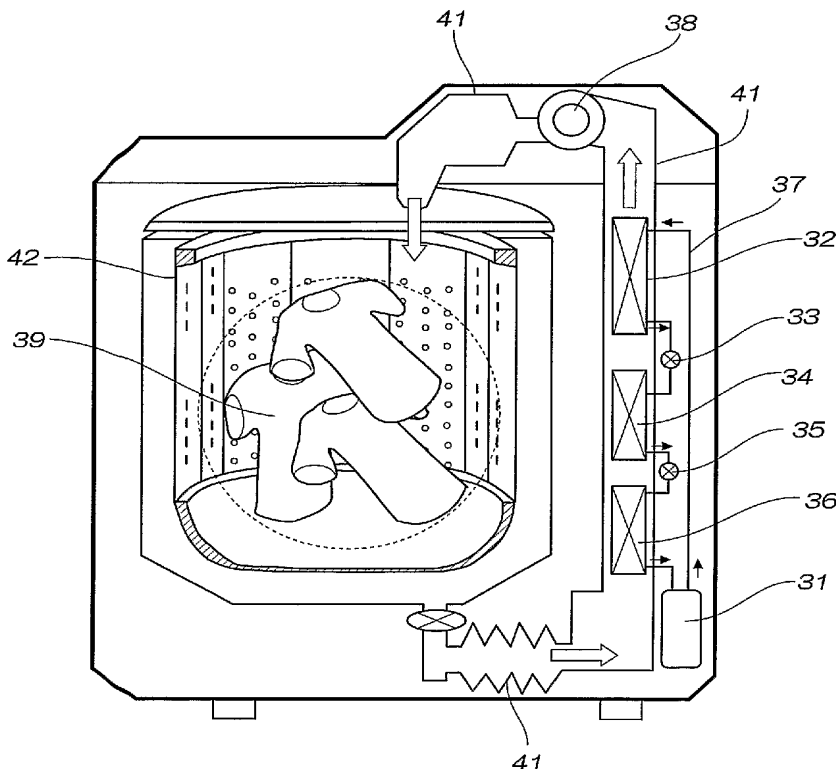
(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG,
KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(30) Priority Data:
2004-043543 19 February 2004 (19.02.2004) JP

(71) Applicant (for all designated States except US): **MAT-
SUSHITA ELECTRIC INDUSTRIAL CO., LTD.**
[JP/JP]; 1006, Oaza Kadoma, Kadoma-shi, Osaka
571-8501 (JP).

[Continued on next page]

(54) Title: HEAT PUMP APPARATUS AND OPERATING METHOD THEREOF



(57) Abstract: In a heat pump apparatus of the invention, a refrigerant is circulated through a compressor 31, a radiator 32, a first throttle apparatus 33, a heat exchanger 34, a second throttle apparatus 35 and an evaporator 36 in this order. The heat exchanger 34 can be utilized as both a radiator and an evaporator by operating the first throttle apparatus 33 and the second throttle apparatus 35. Therefore, even if the outside air temperature is high, discharge pressure and suction pressure of the compressor do not rise, the heat pump apparatus can be operated in a stable refrigeration cycle, and energy can be saved.

WO 2005/080896 A1



(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*